## **ABSTRACT**

A method of forming metal oxide powders includes the steps of solid state mixing of at least one metal nitrate salt, such as  $Fe(NO_3)_3$  or a combination of metal nitrate salts such as  $Zn(NO_3)_3$ ,  $6H_2O$  and  $Ga(NO_3)_3$ ,  $xH_2O$ , and at least one reducing organic acid, such as tartaric or citric acid. The mixture is heated to form a metal oxide powder, such as alpha-iron oxide ( $\alpha$ - $Fe_2O_3$ ) or a mixed metal powder such as zinc gallate phosphor ( $ZnGa_2O_4$ ). A metal oxide precursor intermediate can be formed and then heated to form the metal oxide powder.